

setae. These dorsal setae are very small and very pale, and not easy to distinguish, as they are not raised on tubercles. Each thoracic spiracle is marked by a double tubercle, consisting of a prominent, rounded mound with a slightly furrowed surface placed adjacent to the medial aperture, and another mound with a furrowed sloping surface edged by a narrow dark ridge. The rima of the spiracle is very small.

The metathorax bears three pairs of very slender setae.

Abdomen.—The abdominal spiracles are roughly circular in shape, flattened, and very slightly elevated. The first segment bears two pairs of setae on the dorsum. Segments 2-7 each bear a girdle of slender setae and heavy spines. On the dorsal surface there are numerous short heavy spines and about eight long slender setae on segment 2; the number of heavy spines is reduced in succeeding segments, until on segment 7 there are four or six heavy spines and ten long setae. On the ventral surface there are about twelve long, widely spaced setae on segment 2, and about the same number close together on segment 7. Laterally there are about ten long setae on each side of each segment. On segment 8 (Text-figs. 12-14) there is an incomplete circling of long setae, there being none on the dorsal surface; the setae are very long dorsolaterally, and they decrease in length towards the ventral surface, which is bare in the centre. The segment terminates in an aster of two long dorsal projections, with a small knob placed at the base of each. An aster of this type was described by Fuller (1936) for *Scaptia auriflua* (Don.).

SCAPTIA MUSCULA, n. sp. (Text-figs. 15-34).

A grey, hairy, unadorned species, which belongs structurally to the *violacea* group (Mackerras, unpublished), but because of its small size, rounded shape and general grey colour it cannot be confused with any other described member of the genus. The flies rather resemble blowflies in general shape, with more or less rounded thorax and abdomen. The sexes are very similar in colour and size; if anything, the males are slightly larger than the females. Average length, excluding antennae, 10 mm., average width across thorax at wing base 3.5 mm.; length of wing 9 mm. The eyes have green and bronze lights in living specimens.

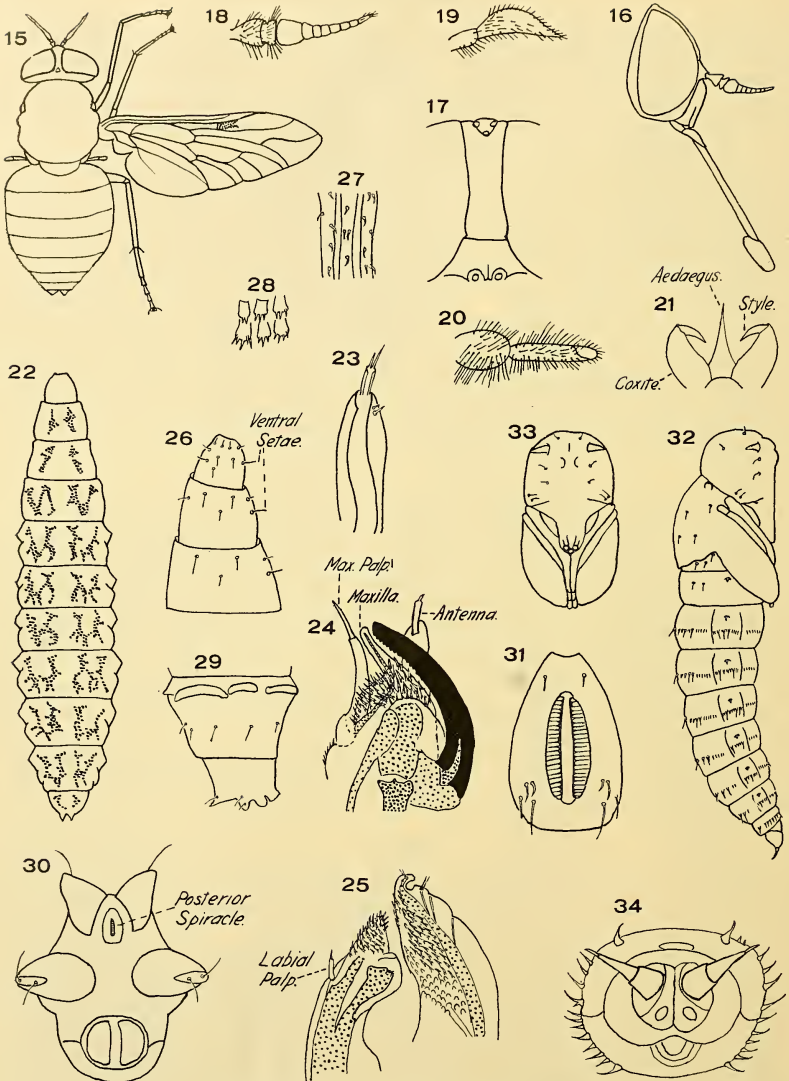
The holotype ♀, allotype ♂, two ♀ and four ♂ paratypes were all reared from larvae and one pupa collected in New South Wales within 60 miles of Sydney. The types are in the Macleay Museum, University of Sydney.

The flies were submitted for identification to Dr. I. M. Mackerras, who considered them to belong to a new species; he submitted them to Mr. H. Oldroyd, of the British Museum (Natural History), who agreed with the determination.

Occurrence.

Four adults only of this species have been collected in the field, all in N.S.W.: Woy Woy, 5 Oct., 1924, Nicholson, 2♂♂; Oatley, Oct., 1924, 1 ♂, in the collection of The School of Public Health and Tropical Medicine, University of Sydney; and Chatswood, 21 Oct., 1952, 1 ♀, collected by the writer.

Larvae were found first by Mr. J. Burden, when collecting larvae of Myrmeleontidae in the deposits of fine sand that occur beneath overhanging sandstone rocks. The pits made by the ant-lion larvae are to be found even in very small sand patches, and even where the overhang is very small or very low; but most of the *Scaptia* larvae have been found where the overhanging ledge was five feet or more from the sandy floor, though at Woodford larvae were found at the back of a small cave, where the roof was less than three feet high, but where there was quite an extensive area of sandy floor. Six larvae were collected by Mr. Burden in 1949 and 1950, and 27 have since been found by the writer; fourteen at Roseville, four at Woodford on the Blue Mts., and others in various localities in the vicinity of Sydney. Some of the larvae were killed and preserved, some pupated, and eight adults emerged. Fifteen larvae still remained alive in June, 1954, of which three had been collected in October, 1952. The larvae had fed fairly readily on various Lepidopterous pupae and latterly on the *Ephestia* pupae.

Text-figures 15-34. *Scaptia muscula*, n. sp.

15-21, Imago.—15, dorsal view, $\times 4$ approx.; 16, head, lateral view, $\times 6$ approx.; 17, frons, $\times 12$ approx.; 18, antenna, $\times 20$, approx.; 19, ♀ maxillary palp, $\times 20$ approx.; 20, ♂ maxillary palp, $\times 20$ approx.; 21, ♂ hypopygium, $\times 20$ approx.

22-31, Larva.—22, dorsal view, $\times 4$ approx.; 23, antenna, $\times 45$ approx.; 24, mandible and maxilla, $\times 45$ approx.; 25, labrum and labium, $\times 45$ approx.; 26, thorax, lateral view, $\times 8$ approx.; 27, armature of anterior part of annulus, $\times 250$ approx.; 28, armature of posterior part of annulus, $\times 250$ approx.; 29, abdomen, segments 7 and 8, lateral view, $\times 8$ approx.; 30, abdomen, segment 8, end view, $\times 20$ approx.; 31, posterior spiracle and spiracular area, $\times 150$ approx.

32-34, Pupa.—32, lateral view, $\times 4$ approx.; 33, head and thorax, ventral view, $\times 4$ approx.; 34, 8th segment of abdomen, end view, $\times 15$ approx.

After emerging, some of these *Scaptia* were kept alive up to six days in small jars, in which they fed readily on moistened raisins. The jars were kept covered with dark material in an endeavour to keep the flies from battering their wings on the sides. These flies at times emitted a high-pitched hum, quite audible a few feet away, and apparently the sound was not due to vibration of the wings in any way.

Imago (Text-figs. 15-21).

Female (Text-figs. 15-16).—Head a little wider than thorax. Eyes covered with light buff coloured hairs. Frons (Text-fig. 17) diverging slightly posteriorly and anteriorly, and converging slightly near centre and at the anterior angle, with light olive-grey pollinose covering and short light buff hairs. Subcallus moderately produced, with light olive-grey pollinose covering and without hairs; parafacials with similar pollinose cover and long pale hairs. Beard of light buff and warm buff very long hairs. Face prominent, with deep olive-grey pollinose covering, and with long warm buff hairs at sides, sparse short hairs on upper centre and no hairs on lower centre. Antennae (Text-fig. 18) length about half height of head; first segment, viewed laterally, about as wide as long; second segment about same width, but very short; both with capucine buff pollinose covering and long black and light buff hairs; third segment subulate, 8-annulate, orange or orange-buff in colour. Palpi about one-fourth as long as shaft of proboscis; first segment mouse-grey, with long silvery and tawny hairs; second segment (Text-fig. 19) as figured, flattened, orange-buff in colour, with sparse pale hairs on lower edge and black hairs partly surrounding a lateral bare area. Proboscis a little longer than height of head, moderately slender, with expanded, only partly chitinized labella.

Thorax.—Dorsum covered with deep olive-grey tomentum, with narrow light grey stripes and tawny recumbent hairs, with light buff hairs above wing base. Pleural hairs white, and much longer and thicker than on dorsum. Halteres chestnut-brown.

Abdomen a deep olive-grey pollinose covering, with shining orange-buff recumbent hairs on tergites and shining light buff recumbent hairs on sternites. Cerci tawny.

Legs orange-buff, with long light buff hairs on femora, shorter hairs, mostly black but some tawny, on tibiae, and short recumbent hairs on the tarsi, black on the dorsal surface and tawny on the ventral surface.

Wings clear, with a small but definite dresden-brown stigma between R_1 and R_2 ; cell R_3 open, but somewhat narrowed.

Male.—Very similar to female, except that it is more heavily clothed with longer hairs, and there are slight differences in colour. Eyes contiguous, upper facets not enlarged. Sides of face liver-brown in colour. The first segment of the palp (Text-fig. 20) is bulbous, liver-brown in colour, and clothed with long silvery hairs; the second segment is slender and cylindrical, liver-brown, with long silvery hairs, except the tip, which is pale orange-yellow, slightly flattened, and bare except for some hairs on the edges.

The hypopygium (Text-fig. 21) has a long, rather narrow aedeagus and a simple pointed style.

The eight specimens examined are remarkably uniform in appearance, but there are slight variations in the colour of the tomentum and in the length and colour of the hairs. In two specimens, a male and a female, the dorsum of the thorax is much darker, as the pollinose covering is lacking on a large part of it, and there are numerous black upright hairs as well as tawny hairs. The absence of the pollinose covering is probably not due to rubbing, as the hairy covering is intact.

Eggs were not found.

The colours in this description have been identified as accurately as possible with the aid of Ridgeway's Colour Chart.

Larva (Text-figs. 22-31).

The larvae found varied in length, when contracted, from 7 mm. to about 16 mm., and up to 6 mm. in width. When the larva contracts, the head is completely withdrawn, the thoracic segments are partially telescoped, and the larva appears to be truncated

at both ends. When it extends, it tapers gradually anteriorly to the very small head, and is widest at the fourth and fifth abdominal segments. The body of the larva appears to be slightly flattened, as the large, elongated swellings of the lateral pseudopods make it appear broader than high; but preserved specimens appear more cylindrical, because the lateral swellings have contracted.

The integument has fine, longitudinal striations, is transparent and glass-like, and there is a layer containing pigment beneath it. There is an irregular pattern of the purplish-brown pigment (Text-fig. 22) on the dorsal and ventral surfaces of each segment except the prothorax; it varies somewhat in different larvae, but the general appearance is similar. The text-figure shows the pattern of a partly contracted larva, when the lines of pigment appear broad; but, when the larva extends, the lines of pigment lengthen and become thinner, and the unpigmented area is more extensive. The pattern remains visible in carefully preserved spirit specimens, and may also be preserved in slides, if the abdominal contents of the larva are removed but the muscles attached to the body wall left undisturbed as much as possible. The pigmented layer is not shed with the larval exuviae, but remains in the pupa, where it is distinct and complete in the abdomen, and there are faint traces of it in the meso- and metathorax. The integument is not transparent enough, when dry, for the eye-spots and Graber's organ to be seen. If, however, the larva is placed in water and the dust gently washed off, then, whilst it is still wet, the black bodies of Graber's organ can just be seen and the eye-spots are large and conspicuous.

Head.—The head capsule is long and slender, up to nearly 4 mm. in length and 0.75 mm. broad.

The antennae (Text-fig. 23) appear to be three-segmented. The first segment is 0.47 mm. long, with a definite internal chitinous structure, and two small sense organs on the anterior dorsal area; the second segment is short, 0.1 mm. in length, slender, and with an internal chitinous structure similar to the first segment; it bears the bifid terminal segment, which has both branches slender, tapering and pointed, and one much longer than the other.

Mouth Parts.—The mandibles (Text-fig. 24) are almost square at the tip, and only very slightly serrated on the lower margin; they are heavily chitinized, but the mandibular canal can be seen in slide mounts. The maxillae are of clear chitin, each consisting of a long, narrow, blade-like distal part, and a wide basal part armed on the anterior margin with long, pointed hairs. The maxillary palp is three-segmented; the first segment short; second long, with an internal chitinous structure similar to that in the antenna; the third long, slender and tapering to a point.

The labrum (Text-fig. 25) consists mainly of clear chitin. On the dorsal surface are several sensory pits, nearer the apex is a pair of strong setae, beyond these is a deep indentation, and the labium ends in an upturned portion bearing a pair of slender setae. The ventral surface is covered with papillae bordered laterally with long pointed hairs or setae. The labium is a bi-lobed, tongue-like structure, densely covered with hairs. It is attached to the heavily chitinized pharynx support; salivary ducts run back to the large salivary pump; and there is a pair of labial palps on the ventral surface. The labium is very similar to that of *S. vicina* Tay. described in this paper and *S. auriflua* (Don.) described by Fuller (1936).

Thorax (Text-fig. 26).—The prothorax is encircled anteriorly with a wide collar or annulus armed with spines. The anterior part bears longitudinal bands of thickened epithelium, with short backwardly directed spines (Text-fig. 27); these bands gradually merge into separated scales which cover the posterior part, each scale (Text-fig. 28) being armed on the posterior border with three to five short spines. The appearance of scales is scarcely evident unless the exuviae are stained before mounting, but the spines are to be seen in unstained mounts. Each thoracic segment bears two groups of setae on the ventral surface, one on each side of the middle line, each group consisting of one long, strong seta, which can be seen in preserved whole larvae with magnification $\times 10$, and one or more very fine short setae, which can be seen only in

slide mounts with high power. There are also irregular rows or circlets of single hairs on each thoracic segment: sixteen or eighteen small hairs in three rows on the prothorax, about ten larger hairs in two rows on the mesothorax, and about eight large hairs in two rows on the metathorax. These hairs are mostly on the dorsal and lateral surfaces, and some can be seen in spirit specimens with magnification $\times 30$.

Abdomen.—The integument is thickened and folded to form pseudopodia near the anterior border of segments 1–7. On the dorsal surface of each segment are paired pseudopods meeting in the centre and forming a low transverse ridge; on the ventral surface is a slightly thicker pair, which do not meet in the centre; and on each side is a small dorsolateral pseudopod and a larger, more prominent lateral one. There is also a series of irregular folds or ridges in the integument, and behind the larger pseudopod is a distinct swelling extending almost to the posterior edge of the segment; it is this structure that gives the appearance of width to the live larva. On this swelling are two long hairs, one above the other, which can be seen in spirit specimens with a magnification $\times 30$, and these, together with four or six small hairs, form an irregular circlet on each segment.

The eighth segment (Text-figs. 29 and 30) is abruptly truncated. It bears dorsally two low, broad, pointed processes, with one long hair set below the apex on each; laterally on each side is a long, low process bearing two long hairs; on the ventral surface is the anus surrounded by the prominent folds of the anal tubercle; and on the posterior surface is the posterior spiracle set in a flat almost triangular spiracular area. The spiracle (Text-fig. 31) is of typical Tabanid form, and there is no siphon. There are fine hairs on the spiracular areas visible only on slide mounts with high power, one on each side just above the spiracle, and four on each side below it.

Pupa (Text-figs. 32–34).

Eight pupal exuviae were obtained from reared specimens. One female pupa is approximately 18 mm. long and 4 mm. wide on thorax. The pupal skin is of very thin, transparent chitin, which does not become dark in colour, and this permits the larval pigment to be seen.

The head and thorax (Text-figs. 32–33) are armed with very small, slender setae, which can be seen with a hand lens only with difficulty. The head bears six pairs of small setae. The sheath of the proboscis is very long, and extends to the sheath of the first pair of legs, as in *S. vicina*. The thorax bears a basal alar seta on each side, and three pairs of very small setae on the dorsum, but the central pair may be hidden in exuviae by the folding at the suture. The thoracic spiracle is on a definite mound, but the C-shaped rima is so small that it is almost indistinguishable. The metathorax bears three pairs of fine setae.

Abdomen (Text-fig. 32).—Abdominal segments 1–7 are divided by longitudinal lines into dorsal, ventral and lateral regions. The first segment bears a small spiracle on each lateral region, and two pairs of very small spines on the dorsum. Segments 2–7 bear a small spiracle on each lateral region, and a girdle of spines in a single row about the middle of each segment. On the dorsal surface of segments 2–6 are six to eight large spines flanked on each side by minute spines; on segment 7 there are only four or five large spines, and there may be no minute spines. On the ventral surface of each segment is a row of very small spines, and on segments 6 and 7 there are also two or four larger spines. The spines on the lateral areas vary considerably in number and size in different specimens. There may be four or six, some long, some short, and they are more or less short on segment 2 and much longer on segment 7, but they do not increase in size with any apparent regularity as they progress backwards. The last segment (Text-fig. 34) bears an incomplete girdle of spines; the centre of the dorsum is bare, and the dorso-lateral spines are more or less larger than the ventro-lateral ones. In the male pupa there is a ventral row of small spines; in the female the centre of the ventral surface is bare. The segment terminates in an aster of two tubercles each bearing a single strong spine. The terminal spines are much longer than those figured for *S. auriflua* (Don.) by Fuller (1936).

CONCLUSION.

Fuller (1936) gave some characters of the larvae and pupae of *Scaptia* and *Goniops*, and suggested that they might prove to be distinguishing characters of the subfamily Pangoniinae. The larval characters could be observed in living or spirit specimens. Other characters, which can be seen in slide mounts of exuviae of larvae of *Scaptia* and *Ectenopsis*, are now suggested as possibly distinguishing Australian Pangoniinae at least:

Larva.—Annulus of prothorax partly or wholly covered with scales armed with backwardly directed spines. Maxilla with long, slender, blade-like distal part.

For the pupa, Fuller gave "The aster is reduced to two large projections at the end of the terminal segment". This character does not hold for *Ectenopsis* (English, 1952), so an addition is suggested:

Pupa.—If the terminal segment has six projections, then there are three pairs of strong dorsal setae on the thorax.

These setae are strong in *Ectenopsis*. Some *Scaptia* pupae, if not all, also have three pairs of dorsal setae, but they are so small and slender that they are difficult to detect, and if, as so often happens, they are broken off, their position cannot be located, as they have no basal tubercles.

On examining comparable characters of the available larvae and pupae of Australian species of other groups, it was found that in the larvae (*Tabanus* two spp., *Dasybasis* four spp., *Lilaea* one sp.) the annulus of the prothorax is densely covered all over with short hairs or spines, and the maxilla is broad with a very short terminal portion; in the pupae (*Tabanus* four spp., *Dasybasis* five spp.) the aster has six projections, and there are two pairs of dorsal setae on the thorax. The aster is also described as having six projections in *Haematopota* and *Chrysops*.

The larval habitat of *S. muscula* (clean sand under rock ledges, frequently very dry) is very different from that of *S. vicina* and *S. auriflua*, and these differ from one another, as the soil where *S. vicina* was found was too dry for Tipulid larvae, which were numerous for at least part of the year in the soil where *S. auriflua* was found.

The two pupae described in this paper have the sheath of the proboscis very elongated, but this does not occur in all *Scaptia* pupae. The writer was able to examine pupae of two species of *Scaptia* from the collection of the Division of Entomology, C.S.I.R.O., Canberra, and in these the sheath of the proboscis is short. The length is presumably to be correlated with the length of the proboscis in the adult.

The material used in the preparation of this paper, i.e., the adult flies with pupal exuviae, and slide mounts of larval exuviae of both species, together with slide mounts of larvae and larvae in spirit of *S. muscula*, have been deposited in the Macleay Museum at the University of Sydney.

Acknowledgements.

The writer is indebted to Professor P. D. F. Murray and Dr. A. R. Woodhill, Department of Zoology, University of Sydney, who made available laboratory accommodation at the Department; to Dr. A. J. Nicholson, of the Division of Entomology, C.S.I.R.O., Canberra, for the loan of specimens; to Dr. D. F. Waterhouse, of the same Division, for advice and help on the problem of feeding larvae; and to Dr. I. M. Mackerras, Queensland Institute of Medical Research, Brisbane, who identified the adults and gave much helpful advice on the preparation of this paper.

References

- ENGLISH, K. M. I., 1952.—Notes on the morphology and biology of *Ectenopsis vulpecula* Wied. var. *angusta* Macq. (Diptera, Tabanidae, Pangoniinae). PROC. LINN. SOC. N.S.W., lxxvii: 270-274.
- FERGUSON, E. W., 1926.—Additional notes on the nomenclature of Australian Tabanidae. *Bull. Ent. Res.*, xvi: 293-306.
- FULLER, M. E., 1936.—Notes on the biology of *Scaptia auriflua* Don. (Diptera, Tabanidae). PROC. LINN. SOC. N.S.W., lxi: 1-9.
- MCATEE, W. L., 1911.—Facts in the life history of *Goniops chrysocoma* (Dipt., Tabanidae). *Proc. Ent. Soc. Washington*, xiii: 21-29.
- MACKERRAS, I. M. (to be published).—The Tabanidae (Diptera) of Australia.

- MALLOCH, J. R., 1917.—A preliminary classification of Diptera exclusive of Pupipara, based on larval and pupal characters, with keys to imagines in certain families. Part 1. *Bull. Ill. Lab. Nat. Hist.*, xii: 355-357.
- RIDGEWAY, R., 1912.—Color Standards and Color Nomenclature. Washington.
- SCHWARDT, H. H., 1934.—Biological Notes on *Goniops chrysocoma* (O.S.) (Dipt., Tabanidae). *J. Kansas Ent. Soc., McPherson*, vii: 73-79.
- STONE, A., 1930.—The bionomics of some Tabanidae (Diptera). *Ann. Ent. Soc. America*, xxiii: 261-304.
- TAYLOR, F. H., 1918.—Studies in Australian Tabanidae. *Rec. Aust. Mus.*, xii: 57.
- WALTON, W. R., 1908.—Notes on the egg and larva of *Goniops chrysocoma* O.S. *Ent. News*, xix: 464-465.
-

A NEW GENUS AND SPECIES OF THE TRIBE LABENINI FROM AUSTRALIA
(PIMPLINAE, ICHNEUMONIDAE).

By ARTHUR W. PARROTT, Wakapuaka Road, Nelson, New Zealand.

(One Text-figure.)

[Read 24th November, 1954.]

Synopsis.

A new genus and species of ichneumon-wasp of the Sub-family Pimplinae are described. The new genus, *Neonotus*, is placed in the Tribe Labenini as defined by Cushman and Rohwer (1920). A generic diagnosis is given together with a key separating it from the closely allied genus *Certonotus* Kriechbaumer. The type of this new genus, *Neonotus*, is *N. chadwickii*, which was bred from a species of Buprestid, *Ethon affine* L. & G., by Mr. C. E. Chadwick, Systematic Entomologist, Department of Agriculture, Sydney.

A small collection of reared Ichneumonidae¹ from known hosts was recently forwarded to me by Mr. C. E. Chadwick, Entomologist, N.S.W. Department of Agriculture, Sydney. Included in this collection were nine specimens of an undescribed species, which represents a new genus closely allied to *Certonotus* Kriechbaumer. As this new species was bred from the Buprestid beetle *Ethon affine* L. & G., it is deemed advisable to give immediate diagnosis of this new form, so that it may be identified and studied by local entomologists.

Tribe LABENINI.

The new genus falls into this tribe as defined by Cushman and Rohwer (1920) in their revision of the Pimplinae. The Labenini is at present represented in Australia by the genus *Certonotus* Kriechbaumer; the present genus is now added, to which I have given the name *Neonotus*.

Genus NEONOTUS, gen. nov.

The following combination of characters will serve to distinguish this genus from other genera of the Labenini:

Labium not exerted; malar space obsolete; antennae sub-clavate, mesonotum elongated, not transversely rugulose or carinate, smooth and finely punctate, notauli present; propodeum declivous posteriorly, aerolated; abdomen smooth and shining, with a few large punctures scattered over the surface of the tergites; spiracles of first abdominal tergite situated at, or slightly basad to, the middle of the segment; ovipositor long, about as long as the abdomen; recurrent vein of forewing not strongly bent inwards with the aerolet large, longer than high and sessile on the radius.

This new genus is allied to *Certonotus* but differs from that genus in many important details. It may be separated as follows:

Malar space at least more than half width of mandibles at base, usually considerably wider; mesonotum transversely rugulose or carinate; scutellum planate *Certonotus* Krb.
Malar space obsolete; mesonotum smooth, finely punctate, without transverse carinae; scutellum convex *Neonotus*, gen. nov.

NEONOTUS CHADWICKII, sp. nov.

Female: 10 mm. long; antennae 9 mm.; ovipositor 5 mm.

Colour black with creamy-white markings, head black with inner and outer orbits white, interrupted dorsally; face white with median black area; mandibles, scape, and antennae black, with segments 23 to 29 white; mesonotum² medially brownish-black, with the anterior lateral borders with a narrow white band; propleurae, mesopleurae, metapleurae and sternum mainly dark brown with the sub-alar tubercles white; scutellum black with apical third and metascutellum white; anterior and middle coxae

mainly whitish, posterior coxae blackish with the apex white; dorsal and ventral surfaces of femora and tibiae mainly whitish shaded with dark brown; middle legs whitish, considerably clouded with brown, the apical tarsal joints and claws entirely brown; posterior legs mainly dark brown, except trochanters dorsally, apex of femora, tibial spurs and basal half of metatarsal joint which are whitish; abdomen black with all segments widely margined posteriorly with white; ovipositor and sheaths mainly dark brown or black.

Face slightly raised in centre and faintly rugose, with an obsolete, longitudinal median furrow: clypeus has three or four large punctures and is clothed with long whitish hairs; anterior margin gently rounded; internal orbits emarginate opposite antennae and sub-parallel below; cheeks about half the diameter of eye in profile, shining, almost impunctate, except for a few minute widely spaced punctures; mandibles wide at base, narrowing towards apex, which is very narrow, with two fine teeth, the upper slightly thicker and longer than lower, the entire margins of mandibles swollen; antennae with 31 segments, first segment about twice as long as second, the following segments decreasing slightly in length to about the eighteenth, the remaining segments being subequal in length, about as wide as long, the apical segment elongated; upper angles of pronotum not produced; mesonotum elongate, punctate, not transversely rugose; notauli faintly marked, although the median lobe is somewhat prominent, with an obsolete median depression; scutellum convex, declivous posteriorly without lateral carinae; scutellum fovea deep and smooth; propodeum areolated, all areas plainly indicated, basal area subquadrate, areolar area wider than long; spiracles elongate oval; propleurae very finely punctate, mesopleurae and metapleurae similarly punctate and clothed with short white pubescence; mesopleurae with a glabrous area adjacent to posterior border with a short deep longitudinal groove; prepectal carina well developed and sinuated; posterior coxae elongated, nearly twice as long as thick, and on dorsal surface very finely and sparsely punctate; anterior tibiae subequal in length to femora with outer side obliquely grooved on basal half; tibial spurs about half the length of tibiae; spiracles of first abdominal tergite situated slightly before the middle of the segment; abdomen elongated, compressed posteriorly from the fifth tergite; all abdominal tergites smooth, with indications of longitudinal aciculations; ovipositor sheaths clothed with short thick black pubescence. Forewing with nervulus interstitial with basal vein and reclinous; first and second abscissae of cubitus subequal, slightly longer than second abscissa of radius; recurrent vein distinctly bent inwards, with a long fenestra in lower part of upper half; subdiscoidal originating below the middle of the transverse portion of the discoidaeus; third abscissa of radius straight and longer than first abscissa, which originates before the middle of the stigma; discocubital nearly straight but somewhat faintly sinuated about the middle.

Posterior wings with abscissula shorter than the intercubitella; mediella curved at base, longer than the first abscissa of cubitella; nervellus not broken and reclinous. Fore and hind wings are illustrated in Figure 1.

Male: In all essentials agrees with the female but the apical fourth and fifth segments and the face entirely white; the ocelli are slightly larger in the males and the anterior tibiae are normally shaped.

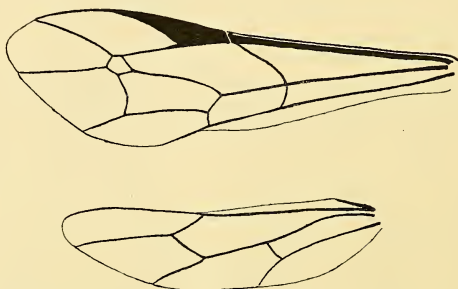
Variation: The venation of the wings varies to some extent, as for instance the relative lengths of the first and second intercubitus and the first and second abscissa of cubitus. The number of white segments of the flagellum varies in different individuals of both sexes.

Location of Types.—The type material is in the collections indicated below. The labels on the specimens refer to data in notes made by the collector.

Holotype ♀ (*d*) Emerged 20th March 1952. Mc.235. Department of Agriculture, Sydney.

Allotype ♂ (*h*) Emerged 13th October 1952. Mc.343. Department of Agriculture, Sydney.

Paratypes: ♂ (*e*) Emerged September 1952. Mc.244. Division of Entomology, C.S.I.R.O., Canberra. ♂ (*c*) Emerged March 1952. Mc.221. Australian Museum, Sydney. ♂ (*g*) Emerged September 1952. Mc.338. (Damaged.) Department of Agriculture, Sydney. ♀ (*i*) Dead in gall, 21st March 1953. Mc.419. (Damaged.) Department of Agriculture, Sydney. ♀ (*a*) Emerged 3rd May 1951. Cawthron Institute, Nelson, New Zealand. ♂ (*b*) Emerged March 1952. (Head missing.) Cawthron Institute, Nelson, New Zealand. ♂ (*f*) Emerged March 1952. Mc.283. Cawthron Institute, Nelson, New Zealand.



Text-fig. 1.—Wing venation of *Neonotus chadwickii* Parrott.

All specimens were bred from galls of the beetle *Ethon affine* L. & G. on *Pultenaea stipularis* Sm. at Middlecove Point, Willoughby, Sydney.

Acknowledgement.

The author wishes to express his very sincere thanks to Mr. C. E. Chadwick, Systematic Entomologist, Department of Agriculture, Sydney, New South Wales, for the opportunity of examining this interesting material. I have much pleasure in naming this new species in honour of Mr. Chadwick.

Reference.

CUSHMAN, R. A., and ROHWER, S. A., 1920.—Holarctic Tribes of the Ichneumon-flies of the subfamily Ichneumoninae (Pimplinae). *Proc. U.S. Nat. Mus.*, 57, No. 2315: 379-396.

AUSTRALASIAN CERATOPOGONIDAE (DIPTERA, NEMATOCERA).
 PART VII.¹ NOTES ON THE GENERA *ALLUAUDOMYIA*, *CERATOPOGON*, *CULICOIDES*
 AND *LASIOHELEA*.

By DAVID J. LEE, B.Sc., and ERIC J. REYE,² M.B., B.S.

(Plate ix; 36 Text-figures.)

[Read 24th November, 1954.]

Synopsis.

The present paper records the occurrence of the genera *Alluaudomyia* and *Ceratopogon* in Australia. Descriptions of seven new species of *Culicoides* are presented together with a new name for one previously described and additional data concerning other species. A discussion of the occurrence of *Lasiohelea* in Australia and the New Guinea area is also included.

1. THE CERATOPOGON GROUP (Lee, 1948, p. 326).

No members of this group have previously been recorded from the Australian mainland, and collecting up to the present does seem to indicate that the group is rather poorly represented in this region. Two genera are now known to occur, *Alluaudomyia* and *Ceratopogon*.

(a) *Alluaudomyia*.

Alluaudomyia Kieffer, J. J., 1913, Voyage Ch. Alluaud et R. Jeannel en Afrique Orientale, Dipt., 1: 12; full synonymy in Wirth, W. W., 1952. Univ. of California Pub. in Entomology, 9, No. 2: 194.

The generic diagnosis given by Wirth (1952) seems adequate for the Australian species, which will be described elsewhere. Wirth's diagnosis is "Eyes bare or hairy, narrowly separated above. Antennae fifteen-segmented, last five segments elongated (female). Wings with macrotrichia towards apex, often adorned with small black spots; first anterior radial cell obliterated, second subequal to first, its apex with veins thickened and ending at about half of wing length; media forked and petiolate. Legs slender, without spines; claws of hind legs of female unequal, inner claws twice as long as outer; empodium vestigial."

This genus is known to occur in both Queensland and New South Wales.

(b) *Ceratopogon*.

Ceratopogon Meigen, J., 1803, Illiger's Mag. Ins., 2: 261. = *Helea* Meigen, J., 1800, Nouv. Class. des mouches à deux ailes, p. 18. For synonymy see Wirth, W. W., 1952, loc. cit.

(Until the controversy concerning the Meigen names of 1800 and 1803 is resolved we retain the name *Ceratopogon* since it is most familiar to Australian entomologists.)

The most recent generic diagnosis is that of Wirth (1952), from which the following is largely taken. Body stout, hairs short and scanty. Eyes more or less pubescent. Antennae with segments 3-10 rounded, 11-15 not very long; male antennae with last three segments elongate. Humeral pits present. Legs rather slender, without

¹ Continued from Vol. 77, p. 324, of these PROCEEDINGS.

² Assisted by a research grant jointly contributed by the Commonwealth Science and Industry Endowment Fund and the Commonwealth Scientific and Industrial Research Organization.